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EXPLANATION OF PLATE 22.

ÆNIGMATISTES AFRICANUS, gen. et sp. nov.

Fig. 1. Dorsal view. $\times 45$.

Fig. 2. Ventral view. $\times 45$. *a*, Antenna; *b*, maxillary palp.

Fig. 3. Head in side view. $\times 85$. *b*, Maxillary palp; *c*, eye; *d*, seta; *e*, lateral edge of pronotum.

Fig. 4. Antenna. $\times 250$. *f*, First joint; *g*, second joint.

Fig. 5. Labrum, maxillary palpi, and hypopharynx. The parts have been separated and the left palpus is shown from the inner aspect. $\times 85$. *ph*, Entrance to pharynx.

The Preservation of Specimens in Australian Museums.

By J. G. OTTO TEPPER, F.L.S.

[Read 21st November, 1907.]

AFTER reading the—for me—very interesting paper “Contribution to the Physiology of the Museum Beetle, &c.,” by Dr. J. Ewart, F.L.S. &c., in No. 195 of the Journal (and the last to hand), I have thought it might not prove amiss if I communicated to you some notes on my experiences relating to the same subject, of which you may make any use you may think it worth while.

For about 24 years I have had the insect collections of the South Australian Museum under my care officially, while at home a considerable botanical collection (mostly Australian) claims my attention privately. Part of the original insect cases (Mrs. Kräusler and Mr. Odewahn, 1850 odd to 1876) were of a rough loose type; the others, though well-made cedar glass cases, were however by no means air-tight, and all were more or less infested with *Anthrenus* and Tineid larvæ, when handed over to me. I cleared them effectively by moistening the specimens with benzol with a camel-hair brush, the youngest larvæ being killed, the others made to quit their lurking places hastily and thus permitting their extermination. After repeated treatments the lepidopterous larvæ, mites, and mould were got rid of for good, while those of the *Anthrenus* only reappeared sparingly and sporadically. However, without some permanent deterrent this method entailed frequent time absorbing inspections, without adequate security against inroads, therefore various substances were successively tried. Camphor proved to be a more or less deceptive expedient, without injuring

the depredating larvæ which had gained ingress. Naphthalene, however, was much more effective; although the *Anthrenus* larvæ were sometimes found concealed under it and as vigorous as possible, yet all other agents were killed out.

In respect of the preventive and preservative effect of naphthalene, I found that a great deal depends upon (a) the form and (b) the quantity applied. Solid lumps and balls proved more or less useless after a few days according to circumstances, the surface becoming dense and smooth, minimising volatilisation. The *scaly* state proved the most effective, the next being the crushed, powdery one, which however soon "cakes" and thus becomes less volatile. The quantity applied and found most satisfactory was from one to two tablespoonsful per case of 24 in. × 18 in. × 3¼ in., according to the greater or lesser hermetic fitting or necessity of frequency of opening. Smaller cases require comparatively little, but too much is preferable to too little. One or two applications per annum has been found quite efficient during several years.

The Tinea moths and several coleoptera, like the *Sitotroga*, &c., complete their life cycles within closed vessels, cases, &c., as long as the food-supply lasts; not so the *Anthrenus*, as the adult beetle can only live by feeding on and among flowers. I have often found them numerous on those of *Eucalyptus*, *Leptospermum*, *Bursaria*, in the woods, and on Roses, *Pyrethrum*, &c., in my own garden. Therefore every generation requires fresh infection from without, and this takes place through the oviposition among the dust in the angles and crevices of protected portions of the floor of the room or cabinets and chests of drawers, or on the back and sides of the cases. From these positions the very active and minute larvæ find their way more or less easily into the interior and the specimens long before their presence is suspected. A moderately liberal application of pyrethrum powder in the *loci* indicated, and occasional rubbing over the sides and backs of cases with a duster, I found quite efficient.

Dr. Ewart rightly draws attention to the fact that the larvæ must have some supply of moisture from external sources, although that be imperceptible to the senses. In fact, I found that if this moisture be so abundant as to become perceptible, mould (*Penicillium*) soon affects the specimens and the live larvæ alike, and fatally in time. The supply is provided by warm air more or less saturated with moisture coming in contact with the specimens, when they had become much colder previously, the condensed deposit being gradually absorbed by the internal substance, and accumulated. This I have prevented by keeping the store-room moderately warm from the end of autumn to early summer or latter part of spring, thus removing the conditions permitting the condensation of such moisture quite satisfactorily. A paper of mine, which perhaps was forgotten to be sent to the Society, will be likewise forwarded, in which this aspect of the matter is treated more fully.